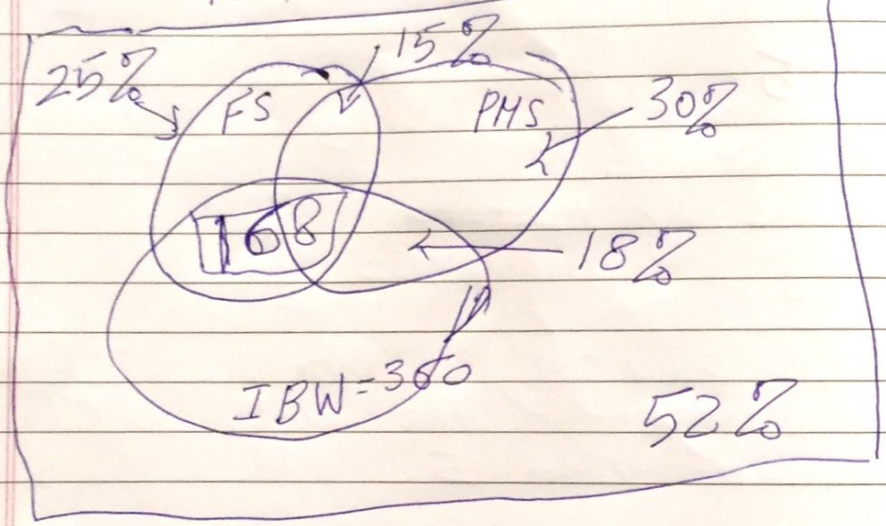
Assignment I

Let Flat Sides = FS (A)
Prominent Mould Seams = PMS (B)
Improper bottom Weight = IBW (C)
Rejected = R
Total number of Sample = 1200



FS = 25% = 300

PMS = 30% = 360

FS ∩ PMS = 15% = 180

No. of bottles having at least one defect = 100% - 52% = 48%

Now $A+B+C-(A\cap B)-(A\cap C)-(B\cap C)+(A\cap B\cap C)=48\%$ (Eqn. 1)

A = 25% = 300
B = 30% = 360
C = 360
] = 1020

$A \cap B = 15\% = 180$

$B \cap C = 18\% = 216$ $\Big]$ $= 564$

$A \cap C = 168$

$A \cap B \cap C = x$

Grade I $= 52\% = 624$

~~Putting x~~ Putting it in Eqn(1)

$1020 - 564 + x = 1200 - 624$

$\therefore x = 120$

Putting the value of x:

Grade I $= 0.52 \times 1200 = 624$

Grade III $= (180 - 120) + (216 - 180) + (168 - 120)$

$= 60 + 96 + 48 = 204$

Grade II $= (300 - 180 - 168 + 120) +$

$(360 - 216 - 180 + 120) + (360 - 216 - 168 + 120)$

$= 72 + 84 + 96 = 252$

Rejected $= x = 120$

Checksum:

$624 + 252 + 204 + 120 = 1200$

Therefore proportion $=$

$624 : 252 : 204 : 120$

Proportion should be $5 : 2 : 2 : 1$

$= 600 : 240 : 240 : 120$

The question now is: How should we compare the Sample and the Expectation This leads to the concept of Statistical Inference